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ARMY ELECTRONICS RESEARCH AND DEVELOPMENT COMMAND WS--ETC F/G 4/2  
19702A GSR5, MISSILE NUMBER 311, ROUND NUMBER 8-39, 10 SEPTEMBER--ETC(U)  
SEP 79

UNCLASSIFIED ERADCOM/ASL-DR-1067

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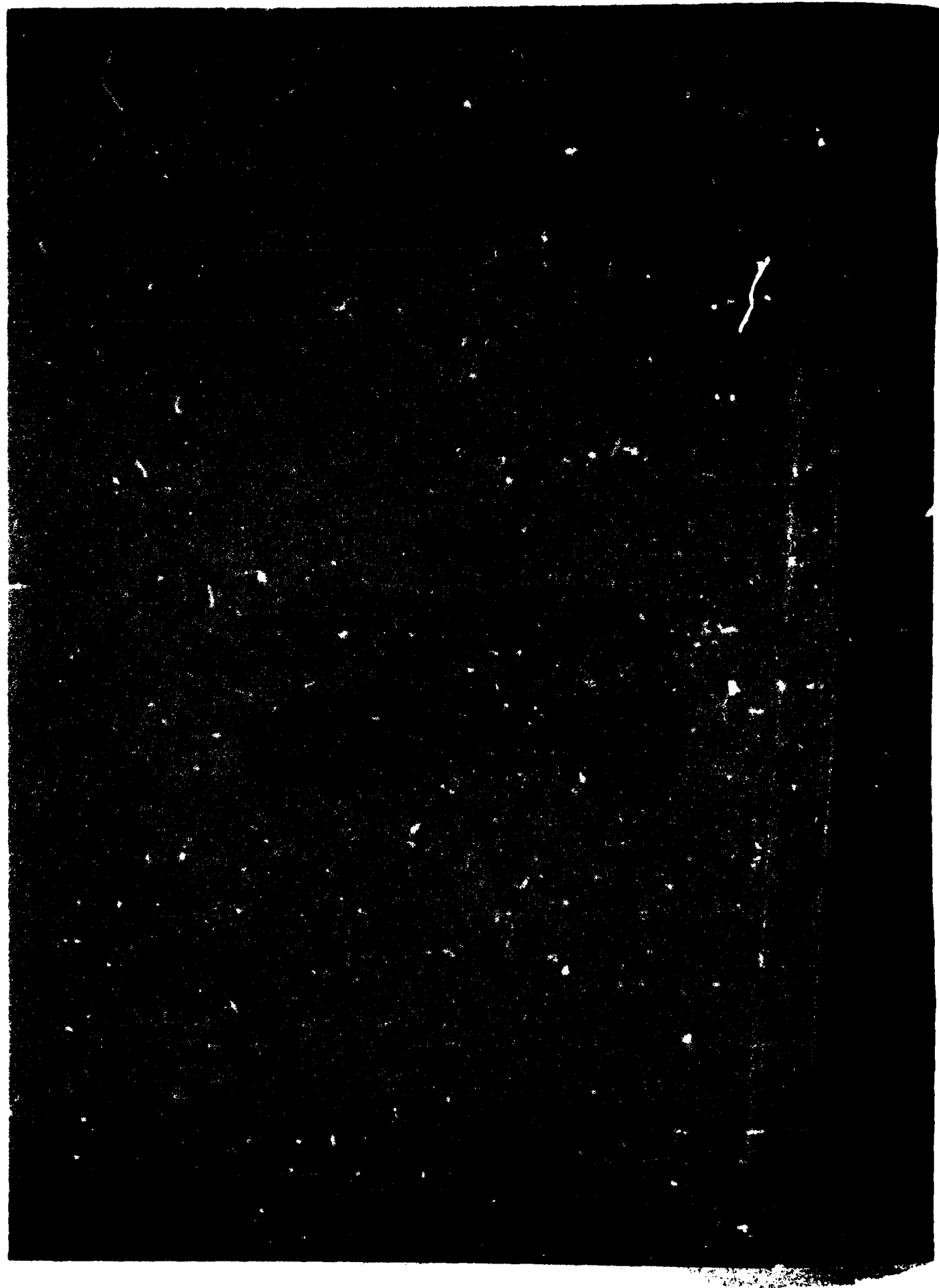
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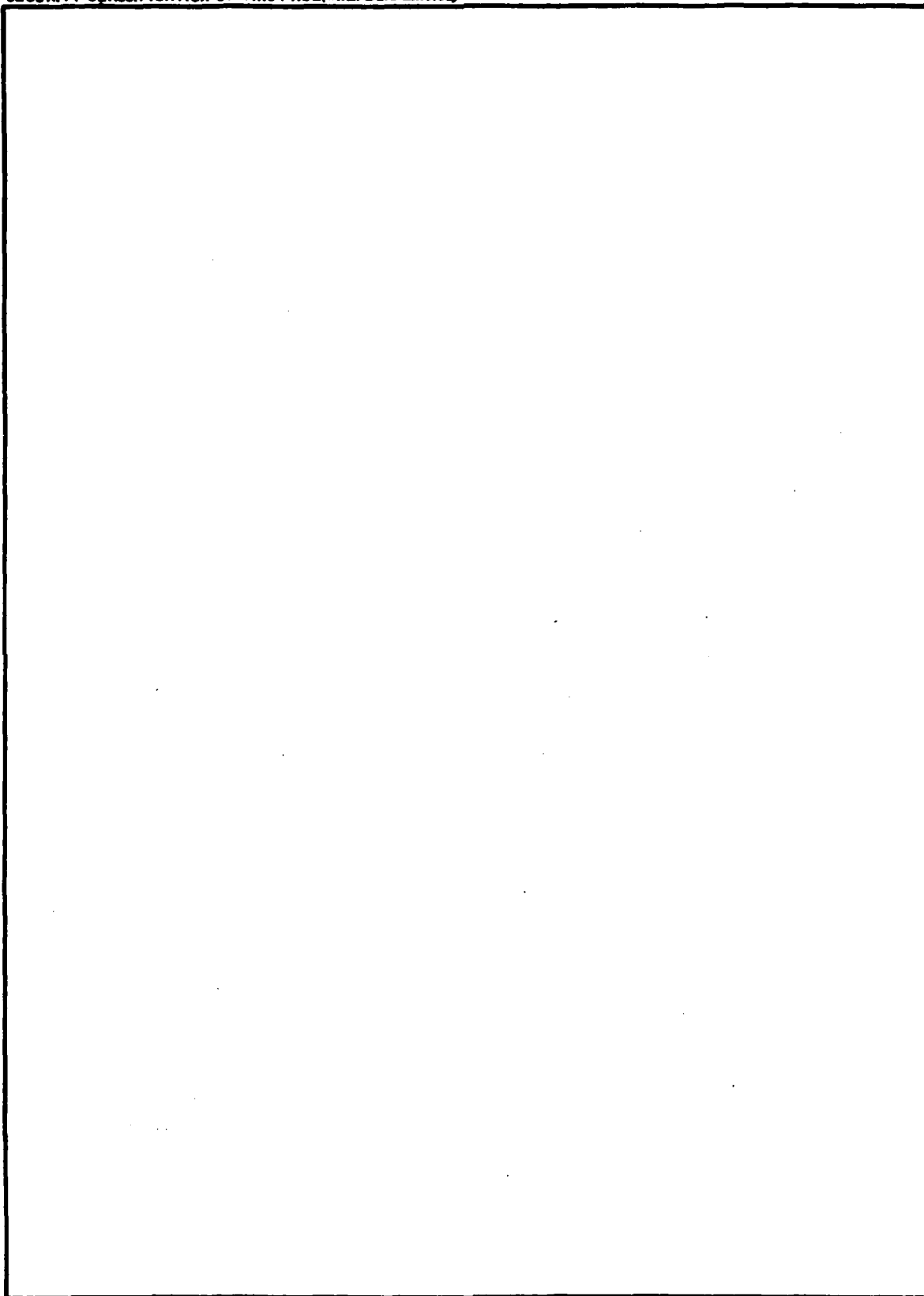
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Meteorological data gathered for the launching of 19702A GSRS, Missile Number 311, Round Number B-39 are presented in tabular form.		

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## INTRODUCTION

19702A GSRS, Missile Number 311, Round Number B-39, was launched from LC-33, White Sands Missile Range (WSMR), New Mexico, at 1107 MDT 10 September 1979. The scheduled launch time was 1100 MDT.

## DISCUSSION

Meteorological data were recorded and reduced by the White Sands Meteorological Team, Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, New Mexico. The data were obtained by the following methods:

### 1. Observations

#### a. Surface

(1) Standard surface observations to include pressure, temperature ( $^{\circ}\text{C}$ ), relative humidity, dew point ( $^{\circ}\text{C}$ ), density ( $\text{gm}/\text{m}^3$ ), wind direction and speed, and cloud cover were made at the LC-33 Met Site at T-0 minutes.

(2) Anemometer data were provided from existing pole-mounted and tower-mounted anemometers at LC-33. Monitor of wind speed and direction from one anemometer was also provided in the launch control room.

#### b. Upper Air

(1) Low level wind data were obtained from RAPTS T-9 pibal observation at:

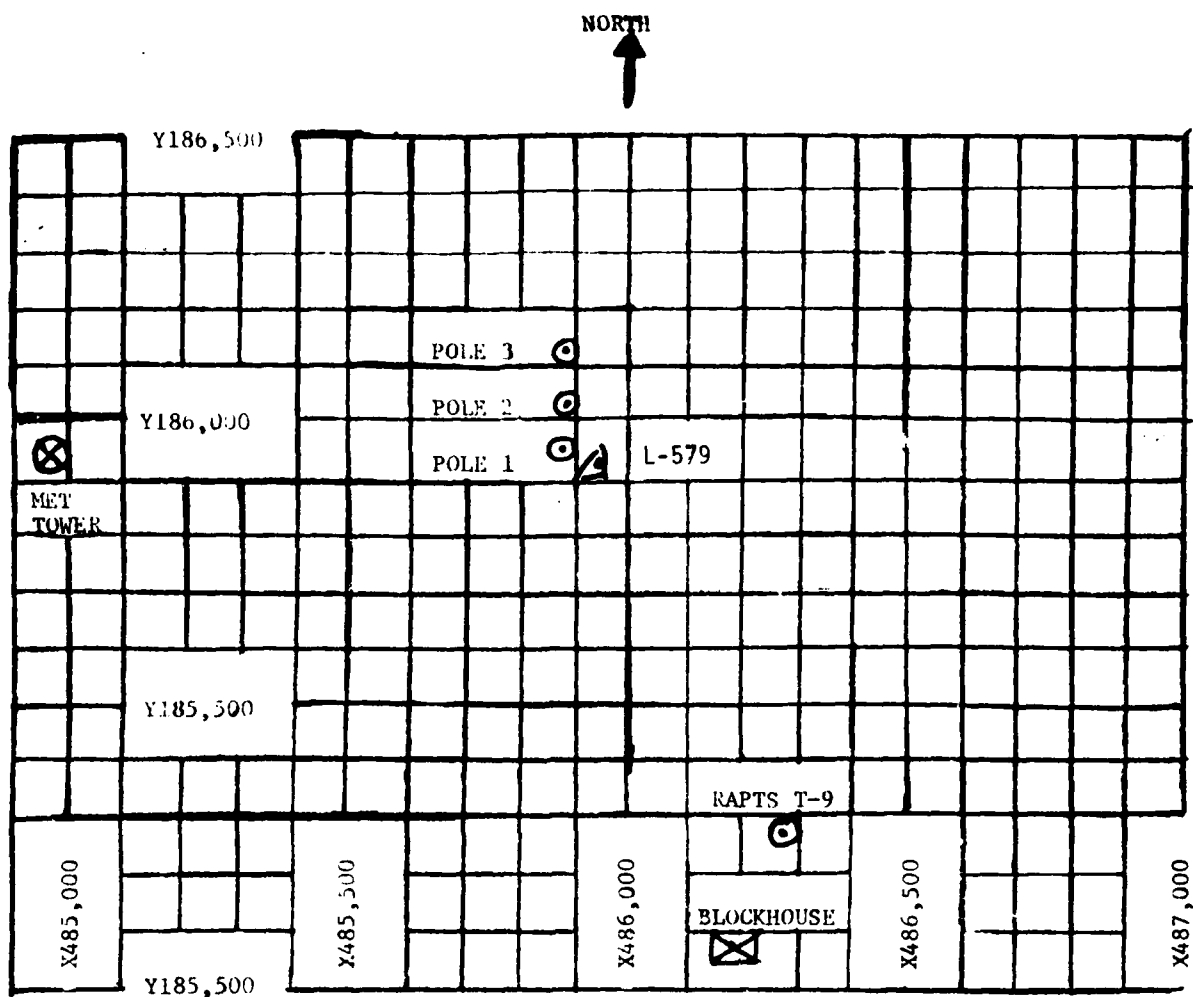
## SITE AND ALTITUDE

LC-33 2160 Meters  
NICK 2160 Meters

(2) Air structure data (rawinsonde) were collected at the following Met Sites. Data were collected from surface to 97,000 feet in 500-foot increments.

## SITE AND TIME

SMR 1000 MST



1. MET TOWER - 4 Bendix Model T-20 Anemometers at 12 ft, 62 ft, 102 ft, and 202 ft with E/A recorders.
2. POLE ANEMOMETER - Bendix Model T-120 with E/A recorders.
  - (a) Pole #1 - 38.7 ft
  - (b) Pole #2 - 53.0 ft
  - (c) Pole #3 - 83.6 ft
3. RAPTS T-9 Radar Automatic Pilot-Balloon Tracking System T-9 Radar.



TABLE 1. Surface Observations taken at 1107 MDT,  
10 September 1979, at LC-33, 19702A GSRS,  
Missile Number 311, Round Number B-39.

ELEVATION	3977.30	FT/MSL
PRESSURE	880.7	MBS
TEMPERATURE	26.0	°C
RELATIVE HUMIDITY	37	%
DEW POINT	10.1	°C
DENSITY	1011	GM/M <sup>3</sup>
WIND SPEED	03	KTS
WIND DIRECTION	165	DEGREES
CLOUD COVER	CLEAR	

LC-33 FIXED POLE ANEMOMETER MEASURED WINDS

POLE #1			POLE #2			POLE #3		
T-TIME SEC	DIR DEG	SPEED KTS	T-TIME SEC	DIR DEG	SPEED KTS	T-TIME SEC	DIR DEG	SPEED KTS
-30		CALM	-30	161	01	-30	128	02
-20	142	02	-20	156	01	-20	123	02
-10	141	03	-10	120	03	-10	145	03
0.0	116	05	0.0	118	03	0.0	151	03
+10	115	04	+10	129	03	+10	130	04

POLE #1 = X485,874.29 Y185,958.90 H4018.74 38.7 ft. AGL

POLE #2 = X485,874.93 Y186,012.00 H4033.57 53.0 ft. AGL

POLE #3 = X485,877.29 Y186,116.06 H4063.92 83.6 ft. AGL

TABLE 2

TYPE 19702A GSRS MISSILE NO. 311 ROUND NO. B-39

LAUNCHED FROM LC-33 DATE 10 September 1979 TIME 1107 MDT

NOTE: WIND DIRECTIONS ARE REFERENCED TRUE NORTH.

LC-33 METEOROLOGICAL TOWER ANEMOMETER MEASURED WINDS (202 FT TOWER)

LEVEL #1 12 Feet			LEVEL #2 62 Feet		
T-TIME SEC	DIR DEG	SPEED KTS	T-TIME SEC	DIR DEG	SPEED KTS
-30	230	02	-30	M	M
-20	228	03	-20	M	M
-10	219	03	-10	M	M
0.0	231	04	0.0	M	M
+10	208	04	+10	M	M
LEVEL #3 102 Feet			LEVEL #4 202 Feet		
T-TIME SEC	DIR DEG	SPEED KTS	T-TIME SEC	DIR DEG	SPEED KTS
-30	223	03	-30	185	01
-20	222	04	-20	186	03
-10	226	04	-10	192	04
0.0	227	04	0.0	192	04
+10	214	04	+10	186	03

WTSM COORDINATES: X484,982.64 Y185,057.73 H3983.00 (base)

TABLE 3

TYPE 19702A GSRS MISSILE NO. 311 ROUND NO. B-39

LAUNCHED FROM LC-33 DATE 10 September 1979 TIME 1107 MDT

NOTE: WIND DIRECTIONS ARE REFERENCED TO TRUE NORTH.

# PILOT BALLOON MEASURED WIND DATA

TABLE 4

RELEASED FROM LC-33 DATE 10 September 1979 TIME 1050 MDT

RELEASE POINT COORDINATES (WSTM) X=486,036.24 Y=182,350.16 H= 3977.30

MISSILE TYPE 19702A GSRS MISSILE NO. 311 ROUND NO. B-39

MISSILE LAUNCHED FROM LC-33 DATE 10 September 1979 TIME 1107 MDT

NOTE: WIND DIRECTIONS ARE REFERENCED TRUE NORTH.

HEIGHT - METERS AGL

HEIGHT AGL	DIRECTION DEGREES	SPEED KTS
SFC		CALM
60	168	04
120	171	05
180	174	06
240	177	08
300	162	07
360	146	06
420	131	05
480	115	04
540	126	05
600	137	06
660	148	06
720	158	07
780	156	08
840	153	09
900	150	09
960	147	10
1020	140	09
1080	132	07

HEIGHTS AGL	DIRECTION DEGREES	SPEED KTS
1140	124	06
1200	116	04
1260	103	05
1320	089	05
1380	075	06
1440	061	06
1500	059	07
1560	056	07
1620	054	08
1680	051	08
1740	062	10
1800	072	12
1860	082	14
1920	092	15
1980	090	14
2040	088	12
2100	086	10
2160	083	08
2220		

# PILOT BALLOON MEASURED WIND DATA

TABLE 5

RELEASED FROM LC-33 DATE 10 September 1979 TIME 1107 MDT

RELEASE POINT COORDINATES (WSTM) X=486,037.24 Y=182,350.16 H=3977.30

MISSILE TYPE 19702A GSRS MISSILE NO. 311 ROUND NO. B-39

MISSILE LAUNCHED FROM LC-33 DATE 10 September 1979 TIME 1107 MDT

NOTE: WIND DIRECTIONS ARE REFERENCED TRUE NORTH.

HEIGHT - METERS AGL

HEIGHT AGL	DIRECTION DEGREES	SPEED KTS
SFC		CALM
60	156	03
120	152	04
180	148	05
240	143	06
300	159	05
360	174	03
420	190	03
480	205	01
540	186	02
600	166	03
660	147	04
720	127	04
780	123	04
840	119	04
900	115	04
960	110	04
1020	114	05
1080	117	06

HEIGHTS AGL	DIRECTION DEGREES	SPEED KTS
1140	120	06
1200	123	07
1260	115	07
1320	107	06
1380	099	06
1440	090	06
1500	087	07
1560	084	09
1620	081	10
1680	078	12
1740	082	13
1800	085	14
1860	088	15
1920	091	17
1980	090	15
2040	088	13
2100	086	11
2160	084	09
2220		

# PILOT BALLOON MEASURED WIND DATA

TABLE 6

RELEASED FROM NICK DATE 10 September 1979 TIME 1053 MDT

RELEASE POINT COORDINATES (WSTM) X= 470,734.56 Y= 255,775.64 H= 4126.57

MISSILE TYPE 19702A GSRS MISSILE NO. 311 ROUND NC. B-39

MISSILE LAUNCHED FROM LC-33 DATE 10 September 1979 TIME 1107 MDT

NOTE: WIND DIRECTIONS ARE REFERENCED TRUE NORTH.

HEIGHT - METERS AGL

HEIGHT AGL	DIRECTION DEGREES	SPEED KTS
SFC		CALM
60	033	01
120	065	01
180	097	02
240	129	02
300	126	02
360	123	02
420	120	01
480	117	01
540	133	02
600	149	03
660	165	03
720	180	04
780	178	05
840	176	05
900	174	06
960	171	06
1020	158	05
1080	145	04

HEIGHTS AGL	DIRECTION DEGREES	SPEED KTS
1140	132	03
1200	118	03
1260	105	03
1320	091	03
1380	077	03
1440	063	03
1500	066	05
1560	069	06
1620	072	07
1680	074	08
1740	077	09
1800	080	09
1860	083	09
1920	085	09
1980		
2040		
2100		
2160		
2220		

# PILOT BALLOON MEASURED WIND DATA

TABLE 7

RELEASED FROM NICK DATE 10 September 1979 TIME 1103 MDT

RELEASE POINT COORDINATES (WSTM) X= 470,734.56 Y= 255,775.64 H= 4126.57

MISSILE TYPE 19702A GSRS MISSILE NO. 311 ROUND NO. B-39

MISSILE LAUNCHED FROM LC-33 DATE 10 September 1979 TIME 1107 MDT

NOTE: WIND DIRECTIONS ARE REFERENCED TRUE NORTH.

HEIGHT - METERS AGL

HEIGHT AGL	DIRECTION DEGREES	SPEED KTS
SFC		CALM
60	024	02
120	048	03
180	072	05
240	096	06
300	109	06
360	121	07
420	133	07
480	145	08
540	140	07
600	135	06
660	130	06
720	125	05
780	128	05
840	130	04
900	133	03
960	135	03
1020	127	03
1080	119	03

HEIGHTS AGL	DIRECTION DEGREES	SPEED KTS
1140	111	04
1200	103	04
1260	092	04
1320	080	04
1380	068	05
1440	056	05
1500	059	06
1560	061	07
1620	063	08
1680	065	09
1740	072	09
1800	078	09
1860	084	09
1920	090	09
1980	090	08
2040	090	07
2100	090	06
2160	090	04

STATION ALTITUDE 3997.30 FEET MSL  
10 SEP. 79 1000 HRS MST  
ASCENSION NO. 302

SIGNIFICANT LEVEL DATA  
2530060302  
S M R  
TABLE 8

GEODETIC COORDINATES  
32.48034 LAT DEG  
106.42307 LON DEG

PRESSURE	GEOMETRIC ALTITUDE	AIR TEMPERATURE	TEMPERATURE	REL. HUM.
MILLIBARS	MSL FEET	DEGREES	DWPOINT	PERCENT
			CENTIGRADE	
880.1	3997.3	26.3	6.9	29.0
850.0	4996.3	21.7	6.8	38.0
838.4	5387.6	21.5	7.0	39.0
808.8	6405.3	18.2	6.1	45.0
759.8	8152.2	14.1	3.8	50.0
750.2	8504.8	13.7	3.6	51.0
700.0	10407.3	8.7	1.4	60.0
674.8	11402.1	7.3	-8.7	31.0
656.4	12148.7	6.8	-19.7	13.0
620.8	13653.0	7.0	-21.4	11.0
594.6	14812.0	4.7	-23.2	11.0
577.2	15604.1	2.7	-24.8	11.0
552.2	16777.5	1.1	-25.1	12.0
500.0	19379.2	-3.6	-28.8	12.0
456.4	21729.6	-8.1	-30.8	14.0
419.4	23868.3	-13.3	-36.6	12.0
400.0	25047.5	-16.4	-38.3	13.0
370.0	26959.1	-21.2	-40.9	15.0
349.6	28330.5	-23.5	-43.4	14.0
323.6	30173.4	-28.2	-47.3	14.0
311.0	31106.8	-30.7	-49.3	14.0
300.0	31945.1	-32.8		
275.0	33943.3	-37.3		
250.0	36096.7	-40.6		
236.4	37343.4	-43.7		
231.2	37835.1	-44.4		
200.0	40994.8	-50.2		
178.8	43380.5	-55.0		
150.0	47012.4	-63.0		
130.2	49851.2	-68.1		
109.4	53264.4	-72.3		
100.0	55011.8	-71.5		
90.6	56930.8	-72.6		
87.6	57587.9	-70.0		
76.2	60353.5	-66.0		
70.0	62058.6	-64.8		
60.4	65076.4	-58.5		
50.0	69014.2	-57.1		
30.0	79815.0	-52.5		
20.0	88661.4	-43.6		



STATION ALTITUDE 3997.30 FEET MSL  
10 SEP. 79 1000 HRS MST  
ASCENSION NO. 302

SIGNIFICANT LEVEL DATA  
2530060302  
S M R

GEODETIC COORDINATES  
32.48034 LAT DEG  
106.42307 LON DEG

TABLE 8 Cont.

PRESSURE GEOMETRIC ALTITUDE MILLIBARS MSL FEET	TEMPERATURE AIR DEWPOINT DEGREES CENTIGRADE	REL. HUM. PERCENT
13.6 97273.5	-42.3	

STATION ALTITUDE 3997.30 FEET MSL  
10 SEP. 79 1000 HRS MST  
ASCENSION NO. 302

UPPER AIR DATA  
2530060302  
S M R

GEODETTIC COORDINATES  
32.48034 LAT DEG  
106.42307 LON DEG

TABLE 9

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	TEMPERATURE DEWPOINT DEGREES	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
3997.3	880.1	26.3	6.9	29.0	1019.5	675.6	100.0	1.9	1.000269
4000.0	880.0	26.3	6.9	29.0	1019.4	675.6	100.2	1.9	1.000269
4500.0	864.8	24.0	7.0	33.5	1009.5	673.0	131.4	2.5	1.000268
5000.0	849.9	21.7	6.8	38.0	999.7	670.4	148.3	3.5	1.000266
5500.0	835.1	21.1	6.9	39.7	984.1	669.8	157.3	4.6	1.000263
6000.0	820.5	19.5	6.5	42.6	972.3	668.0	160.2	5.8	1.000259
6500.0	806.1	18.0	6.0	45.3	960.3	666.2	159.4	7.1	1.000256
7000.0	791.8	16.8	5.3	46.7	947.2	664.8	156.8	7.4	1.000251
7500.0	777.7	15.6	4.7	48.1	934.3	663.4	152.7	7.2	1.000247
8000.0	763.9	14.5	4.1	49.6	921.6	662.0	136.3	6.5	1.000243
8500.0	750.3	13.7	3.8	51.0	907.5	661.2	111.4	6.5	1.000239
9000.0	736.8	12.4	3.2	53.3	895.3	659.6	89.2	8.6	1.000235
9500.0	723.5	11.1	2.6	55.7	883.3	658.1	77.0	11.6	1.000231
10000.0	710.5	9.8	1.9	58.1	871.5	656.5	73.3	11.6	1.000227
10500.0	697.6	8.6	.6	57.3	859.7	655.0	71.2	11.1	1.000222
11000.0	684.9	7.9	-4.0	42.7	846.9	653.9	77.6	8.9	1.000210
11500.0	672.4	7.2	-9.7	28.6	834.0	652.9	89.0	7.3	1.000200
12000.0	660.0	6.9	-16.7	16.6	820.3	652.3	106.2	6.9	1.000191
12500.0	647.9	6.8	-20.0	12.5	805.5	652.1	122.7	7.0	1.000185
13000.0	636.0	6.9	-20.6	11.9	790.6	652.2	136.7	7.4	1.000182
13500.0	624.3	7.0	-21.2	11.2	775.9	652.3	142.2	7.9	1.000178
14000.0	612.8	6.3	-21.9	11.0	763.4	651.5	140.3	8.0	1.000175
14500.0	601.5	5.3	-22.7	11.0	752.1	650.3	134.9	8.4	1.000172
15000.0	590.4	4.2	-23.6	11.0	741.1	649.0	127.5	9.4	1.000170
15500.0	579.5	3.0	-24.6	11.0	730.7	647.5	128.2	10.2	1.000167
16000.0	568.6	2.2	-24.9	11.3	719.1	646.6	133.5	11.1	1.000164
16500.0	558.0	1.5	-25.0	11.8	707.5	645.8	137.1	11.4	1.000162
17000.0	547.5	.7	-25.4	12.0	696.2	644.9	140.0	11.4	1.000159
17500.0	537.2	-.2	-26.1	12.0	685.3	643.8	138.5	10.9	1.000156
18000.0	527.0	-1.1	-26.8	12.0	674.6	642.7	133.9	10.1	1.000154
18500.0	517.1	-2.0	-27.5	12.0	664.0	641.6	132.0	8.9	1.000151
19000.0	507.3	-2.9	-28.3	12.0	653.7	640.6	131.4	7.5	1.000149
19500.0	497.7	-3.8	-28.9	12.1	643.5	639.5	134.5	6.9	1.000146
20000.0	488.1	-4.8	-29.3	12.5	633.3	638.3	139.3	6.7	1.000144
20500.0	478.7	-5.7	-29.7	13.0	623.4	637.2	144.1	7.8	1.000142
21000.0	469.5	-6.7	-30.1	13.4	613.6	636.0	147.5	9.2	1.000139
21500.0	460.5	-7.7	-30.6	13.8	604.0	634.9	146.6	10.9	1.000137
22000.0	451.5	-8.8	-31.5	13.7	594.7	633.6	145.7	12.6	1.000135
22500.0	442.7	-10.0	-32.9	13.3	585.8	632.1	143.5	14.4	1.000133
23000.0	434.0	-11.2	-34.2	12.8	577.0	630.6	141.7	16.3	1.000130

STATION ALTITUDE 3997.30 FEET MSL  
10 SEP. 79 1000 HRS MST  
ASCENSION NO. 302

UPPER AIR DATA  
2530060302  
S M R

GEODETIC COORDINATES  
32.48034 LAT DEG  
106.42307 LON DEG

TABLE 9 Cont.

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE		REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND		WIND DATA		INDEX OF REFRACTION
		AIR DEGREES	DEWPOINT CENTIGRADE			KNOTS	KNOTS	DIRECTION DEGREES(TN)	SPEED KNOTS	
23500.0	425.6	-12.4	-35.6	12.3	568.4	629.2	142.3	16.9	1.000128	
24000.0	417.2	-13.6	-36.8	12.1	559.9	627.6	143.6	17.2	1.000126	
24500.0	408.9	-15.0	-37.5	12.5	551.6	626.1	145.1	16.9	1.000124	
25000.0	400.8	-16.3	-38.2	13.0	543.4	624.5	147.0	16.3	1.000122	
25500.0	392.7	-17.5	-38.9	13.5	535.1	622.9	148.1	16.3	1.000120	
26000.0	384.8	-18.8	-39.5	14.0	526.9	621.4	148.4	17.0	1.000118	
26500.0	377.0	-20.0	-40.2	14.5	518.8	619.8	148.1	17.5	1.000117	
27000.0	369.4	-21.3	-40.9	15.0	510.8	618.3	147.0	17.8	1.000115	
27500.0	361.8	-22.1	-41.9	14.6	502.0	617.3	148.3	17.8	1.000113	
28000.0	354.4	-22.9	-42.8	14.2	493.4	616.3	152.3	17.7	1.000111	
28500.0	347.1	-23.9	-43.7	14.0	485.2	615.1	158.9	17.5	1.000109	
29000.0	339.9	-25.2	-44.8	14.0	477.5	613.5	167.9	17.5	1.000107	
29500.0	332.9	-26.5	-45.8	14.0	470.1	611.9	174.9	17.3	1.000105	
30000.0	326.0	-27.8	-46.9	14.0	462.7	610.3	180.9	17.0	1.000104	
30500.0	319.1	-29.1	-48.0	14.0	455.5	608.7	184.0	16.4	1.000102	
31000.0	312.4	-30.4	-49.1	14.0	448.3	607.0	187.4	15.8	1.000100	
31500.0	305.8	-31.7	-50.4	7.4**	441.2	605.4	187.9	15.3	1.000098	
32000.0	299.3	-32.9			434.0	603.8	187.1	14.9	1.000097	
32500.0	292.8	-34.0			426.7	602.4	184.5	14.4	1.000095	
33000.0	286.5	-35.2			419.4	601.0	180.3	13.9	1.000093	
33500.0	280.4	-36.3			412.4	599.6	179.9	13.1	1.000092	
34000.0	274.3	-37.4			405.3	598.2	187.2	12.0	1.000090	
34500.0	268.3	-38.2			397.7	597.2	196.9	11.2	1.000089	
35000.0	262.4	-38.9			390.3	596.2	212.1	11.2	1.000087	
35500.0	256.7	-39.7			383.0	595.3	226.0	12.0	1.000085	
36000.0	251.1	-40.5			375.9	594.3	235.1	12.1	1.000084	
36500.0	245.5	-41.6			369.4	592.8	243.9	12.5	1.000082	
37000.0	240.1	-42.8			363.1	591.2	250.7	13.5	1.000081	
37500.0	234.7	-43.9			356.7	589.8	256.4	14.7	1.000079	
38000.0	229.5	-44.7			349.9	588.8	261.0	16.5	1.000078	
38500.0	224.3	-45.6			343.3	587.6	264.6	18.4	1.000076	
39000.0	219.2	-46.5			336.9	586.5	267.4	20.2	1.000075	
39500.0	214.2	-47.5			330.6	585.3	269.7	22.1	1.000074	
40000.0	209.3	-48.4			324.4	584.1	270.3	23.0	1.000072	
40500.0	204.6	-49.3			318.4	582.9	270.8	23.5	1.000071	
41000.0	200.0	-50.2			312.4	581.7	272.3	24.2	1.000070	
41500.0	195.3	-51.2			306.6	580.4	274.3	25.2	1.000068	
42000.0	190.8	-52.2			300.8	579.1	275.2	25.9	1.000067	
42500.0	186.3	-53.2			295.2	577.7	275.4	26.5	1.000066	
43000.0	182.0	-54.2			289.7	576.4	275.9	26.1	1.000065	

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.

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TABLE 9 Cont.

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION (TN) DEGREES	SPEED KNOTS	INDEX OF REFRACTION
43500.0	177.8	-55.3		284.2	575.1	276.9	24.8	1.000063
44000.0	173.5	-56.4		278.8	573.6	277.6	23.4	1.000062
44500.0	169.4	-57.5		273.6	572.1	277.4	21.9	1.000061
45000.0	165.3	-58.6		268.4	570.7	277.1	20.4	1.000060
45500.0	161.4	-59.7		263.3	569.2	272.4	19.1	1.000059
46000.0	157.5	-60.8		258.4	567.7	266.8	18.0	1.000058
46500.0	153.8	-61.9		253.5	566.3	265.9	17.5	1.000056
47000.0	150.1	-63.0		246.8	564.8	267.5	17.3	1.000055
47500.0	146.4	-63.9		243.7	563.0	268.6	17.4	1.000054
48000.0	142.8	-64.8		238.7	562.4	268.9	17.8	1.000053
48500.0	139.3	-65.7		233.8	561.2	268.9	18.3	1.000052
49000.0	135.8	-66.6		229.1	559.9	266.2	18.3	1.000051
49500.0	132.5	-67.5		224.4	558.7	263.6	18.4	1.000050
50000.0	129.2	-68.3		219.7	557.6	268.4	18.0	1.000049
50500.0	126.0	-68.9		214.8	556.8	274.8	17.6	1.000048
51000.0	122.8	-69.5		210.1	555.9	280.9	16.8	1.000047
51500.0	119.7	-70.1		205.4	555.1	287.4	15.7	1.000046
52000.0	116.7	-70.7		200.8	554.3	293.1	14.2	1.000045
52500.0	113.7	-71.4		196.4	553.4	296.4	11.7	1.000044
53000.0	110.9	-72.0		192.0	552.6	301.4	9.2	1.000043
53500.0	108.1	-72.2		187.4	552.3	308.6	8.8	1.000042
54000.0	105.3	-72.0		182.4	552.6	312.2	8.5	1.000041
54500.0	102.7	-71.7		177.6	552.9	312.8	8.9	1.000040
55000.0	100.1	-71.5		172.9	553.2	311.6	9.6	1.000039
55500.0	97.5	-71.8		168.7	552.8	312.0	10.1	1.000038
56000.0	95.0	-72.1		164.7	552.4	318.5	10.2	1.000037
56500.0	92.6	-72.4		160.7	552.0	324.8	10.4	1.000036
57000.0	90.3	-72.3		156.6	552.1	338.2	9.8	1.000035
57500.0	88.0	-70.3		151.2	554.8	357.5	9.5	1.000034
58000.0	85.8	-69.4		146.7	556.1	17.1	9.9	1.000033
58500.0	83.7	-68.7		142.5	557.1	47.4	9.5	1.000032
59000.0	81.6	-68.0		138.5	558.1	72.9	11.6	1.000031
59500.0	79.6	-67.2		134.6	559.0	88.0	13.6	1.000030
60000.0	77.6	-66.5		130.8	560.0	99.2	15.1	1.000029
60500.0	75.6	-65.9		127.2	560.8	108.0	16.9	1.000028
61000.0	73.8	-65.5		123.8	561.3	112.2	17.9	1.000028
61500.0	72.0	-65.2		120.6	561.8	116.0	19.0	1.000027
62000.0	70.2	-64.8		117.4	562.3	118.9	19.4	1.000026
62500.0	68.5	-63.9		114.0	563.6	121.4	19.3	1.000025
63000.0	66.9	-62.8		110.7	565.0	124.0	19.1	1.000025

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TABLE 9 Cont.

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA DIRECTION DEGREES(TN)	SPEED KNOTS	INDEX OF REFRACTION
63500.0	65.2	-61.8		107.5	566.4	124.3	15.4	1.000024
64000.0	63.7	-60.7		104.4	567.8	124.7	11.6	1.000023
64500.0	62.1	-59.7		101.4	569.2	124.5	9.3	1.000023
65000.0	60.6	-58.7		98.5	570.6	123.0	9.0	1.000022
65500.0	59.2	-58.3		96.0	571.0	121.3	8.7	1.000021
66000.0	57.8	-58.2		93.6	571.2	119.0	9.8	1.000021
66500.0	56.4	-58.0		91.3	571.4	117.1	11.3	1.000020
67000.0	55.1	-57.8		89.1	571.7	115.6	12.6	1.000020
67500.0	53.8	-57.6		86.9	571.9	113.0	12.4	1.000019
68000.0	52.5	-57.5		84.8	572.2	110.3	12.1	1.000019
68500.0	51.2	-57.3		82.7	572.4	108.5	12.0	1.000018
69000.0	50.0	-57.1		80.7	572.6	108.6	12.1	1.000018
69500.0	48.9	-56.9		78.7	572.9	108.6	12.2	1.000018
70000.0	47.7	-56.7		76.8	573.2	108.0	12.3	1.000017
70500.0	46.6	-56.5		74.9	573.5	106.9	12.4	1.000017
71000.0	45.5	-56.3		73.1	573.7	105.8	12.6	1.000016
71500.0	44.5	-56.0		71.3	574.0	104.0	13.1	1.000016
72000.0	43.4	-55.8		69.6	574.3	102.0	13.9	1.000015
72500.0	42.4	-55.6		67.9	574.6	100.3	14.7	1.000015
73000.0	41.4	-55.4		66.2	574.9	99.3	15.1	1.000015
73500.0	40.4	-55.2		64.6	575.2	98.5	15.4	1.000014
74000.0	39.5	-55.0		63.1	575.4	97.8	15.7	1.000014
74500.0	38.6	-54.8		61.5	575.7	95.5	14.8	1.000014
75000.0	37.7	-54.6		60.0	576.0	92.4	13.6	1.000013
75500.0	36.8	-54.3		58.6	576.3	88.6	12.4	1.000013
76000.0	35.9	-54.1		57.2	576.6	89.0	12.3	1.000013
76500.0	35.1	-53.9		55.8	576.8	90.2	12.4	1.000012
77000.0	34.3	-53.7		54.4	577.1	91.4	12.5	1.000012
77500.0	33.5	-53.5		53.1	577.4	91.6	13.8	1.000012
78000.0	32.7	-53.3		51.8	577.7	91.2	15.8	1.000012
78500.0	31.9	-53.1		50.5	578.0	91.0	17.7	1.000011
79000.0	31.2	-52.8		49.3	578.2	91.1	19.0	1.000011
79500.0	30.5	-52.6		48.1	578.5	91.6	19.7	1.000011
80000.0	29.7	-52.3		46.9	578.9	92.0	20.3	1.000010
80500.0	29.1	-51.8		45.8	579.6	93.5	20.7	1.000010
81000.0	28.4	-51.3		44.6	580.3	97.1	20.4	1.000010
81500.0	27.8	-50.8		43.5	580.9	100.7	20.9	1.000010
82000.0	27.1	-50.3		42.4	581.6	103.8	21.0	1.000009
82500.0	26.5	-49.8		41.4	582.2	101.9	21.3	1.000009
83000.0	25.9	-49.3		40.3	582.9	100.1	21.7	1.000009

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TABLE 9 Cont.

GEOMETRIC ALTITUDE MSL FEET	PRESSURE MILLIBARS	TEMPERATURE AIR DEGREES	REL. HUM. PERCENT	DENSITY GM/CUBIC METER	SPEED OF SOUND KNOTS	WIND DATA		INDEX OF REFRACTION
						DIRECTION DEGREES (TN)	SPEED KNOTS	
83500.0	25.3	-48.8		39.3	583.5	98.3	22.0	1.000009
84000.0	24.8	-48.3		38.4	584.2	96.4	22.3	1.000009
84500.0	24.2	-47.8		37.4	584.8	94.5	22.5	1.000008
85000.0	23.7	-47.3		36.5	585.5	92.6	22.8	1.000008
85500.0	23.1	-46.8		35.6	586.1	91.5	23.1	1.000008
86000.0	22.6	-46.3		34.7	586.8	91.0	23.4	1.000008
86500.0	22.1	-45.8		33.8	587.4	90.5	23.7	1.000008
87000.0	21.6	-45.3		33.0	588.1	90.2	23.8	1.000007
87500.0	21.1	-44.8		32.2	588.7	90.8	23.3	1.000007
88000.0	20.6	-44.3		31.4	589.4	91.3	22.7	1.000007
88500.0	20.1	-43.8		30.6	590.0	91.9	22.1	1.000007
89000.0	19.7	-43.5		29.9	590.3	90.7	22.4	1.000007
89500.0	19.3	-43.5		29.2	590.4	89.5	22.6	1.000006
90000.0	18.8	-43.4		28.6	590.5	88.3	22.9	1.000006
90500.0	18.4	-43.3		27.9	590.6	88.6	22.8	1.000006
91000.0	18.0	-43.2		27.3	590.7	90.0	22.5	1.000006
91500.0	17.6	-43.2		26.7	590.8	91.5	22.2	1.000006
92000.0	17.2	-43.1		26.1	590.9	93.6	22.1	1.000006
92500.0	16.8	-43.0		25.5	591.0	98.6	22.7	1.000006
93000.0	16.5	-42.9		24.9	591.1	103.0	23.5	1.000006
93500.0	16.1	-42.9		24.4	591.2	107.2	24.4	1.000005
94000.0	15.7	-42.8		23.8	591.3	108.5	25.1	1.000005
94500.0	15.4	-42.7		23.3	591.4	109.2	25.7	1.000005
95000.0	15.1	-42.6		22.8	591.5	109.9	26.3	1.000005
95500.0	14.7	-42.6		22.2	591.6			1.000005
96000.0	14.4	-42.5		21.7	591.7			1.000005
96500.0	14.1	-42.4		21.3	591.8			1.000005
97000.0	13.8	-42.3		20.8	591.9			1.000005

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TABLE 10

PRESSURE GEOPOTENTIAL		TEMPERATURE		REL. HUM. PERCENT	WIND DATA	
MILLIBARS	FEET	AIR DEGREES	DEWPOINT CENTIGRADE		DIRECTION DEGREES(TN)	SPEED KNOTS
850.0	4993.	21.7	6.8	38.	148.2	3.5
800.0	6707.	17.5	5.7	46.	159.1	7.6
750.0	8505.	13.7	3.8	51.	111.0	8.5
700.0	10397.	8.7	1.4	60.	70.3	11.5
650.0	12399.	6.8	-19.9	13.	119.9	6.9
600.0	14552.	5.2	-22.8	11.	133.9	8.5
550.0	16661.	.9	-25.2	12.	139.3	11.4
500.0	19352.	-3.6	-28.8	12.	133.3	7.0
450.0	22056.	-9.0	-31.8	14.	145.5	12.8
400.0	25005.	-16.4	-38.3	13.	147.1	16.2
350.0	28251.	-23.5	-43.3	14.	155.1	17.6
300.0	31881.	-32.8			187.2	15.0
250.0	36017.	-40.6			236.6	12.1
200.0	40894.	-50.2			272.2	24.2
175.0	43719.	-56.0			277.5	23.9
150.0	46884.	-63.0			267.4	17.3
125.0	50509.	-69.1			276.5	17.5
100.0	54840.	-71.5			311.6	9.6
80.0	59184.	-67.4			84.3	13.3
70.0	61844.	-64.8			119.0	19.4
60.0	64979.	-58.5			122.4	8.9
50.0	68753.	-57.1			108.6	12.1
40.0	73407.	-55.1			98.3	15.5
30.0	79472.	-52.5			91.8	20.0
25.0	83373.	-48.5			97.5	22.1
20.0	88242.	-43.6			91.7	22.1
15.0	94602.	-42.6			110.0	26.3

\*\* AT LEAST ONE ASSUMED RELATIVE HUMIDITY VALUE WAS USED IN THE INTERPOLATION.